Mathematics 1342–Elementary Statistics
Syllabus – 2021-2022

Student Learning Outcomes

Upon successful completion of this course, students will:

1. **Demonstrate factual knowledge including the mathematical notation and terminology used in this course.**
   Students will read, interpret, and use the vocabulary, symbolism, and basic definitions used in statistics, including definitions of measures of central tendency; standard deviation; standardized variable; regression line; coefficient of determination, normally distributed variable; sampling distribution of the mean; sampling distribution of the proportion; point estimate; confidence interval estimate; null hypothesis; alternative hypothesis; critical value; and test statistic.

2. **Describe the fundamental principles including the laws and theorems arising from concepts covered in this course.**
   Students will indemnify and apply the laws and formulas that result directly from the definitions; for example, calculation of measures of central tendency; standard deviations; coefficients of determination; critical values and test statistics.

3. **Apply course material along with procedures and techniques covered in this course to solve problems.**
   Students will use the facts, formulas, and techniques learned in this course to find regression equations for data collected; use regression equations to make predictions; calculate probabilities; find confidence intervals for means and proportions; and perform a variety of hypothesis tests.

4. **Develop specific skills, competencies, and thought processes sufficient to support further study or work in this field or related fields.**
   Students will acquire a level of proficiency in the fundamental concepts and application necessary for further study in academic areas requiring statistics as a prerequisite, or for work in occupational fields requiring a background in statistics. These fields might include education, business, finance, marketing, computer science, physical sciences, nursing, as well as further study in other statistics courses.

Course Content

**Textbook:** *Modeling the World*, fourth Edition, by Bock, Velleman, DeVeaux. The electronic supplement may also be required. The following chapters including the particular sections listed are covered.

1. **Exploring and Understanding Data:** Categorical & Quantitative Data, Distributions, Standard Deviation, the Normal Model.
2. **Exploring Relationships Between Variables:** Scatterplots, Association, Correlation, Linear Regression,
3. **Gathering Data:** Randomness, Sample Surveys, Experiments & Observational Studies
4. **Randomness and Probability:** Probability, Random Variables, Probabilty Models
5. **From the Data at Hand to the World at Large:** Sampling Distribution Models, Confidence Intervals for Proportions, Testing Hypotheses, More about Tests and Intervals
6. **Learning about the World:** Inferences about Means, Comparing Means, Paired Samples and Blocks
7. **Inference When Variables Are Related:** Comparing Counts, Inferences for Regression, Analysis of Variance, Multiple Regression.

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Core Curriculum Student Learning Objectives

1. **Core Objective (Critical Thinking):** Develop and demonstrate a logical position that acknowledges ambiguities or contradictions. (CT2)
   - **Course Student Learning Objective:** Students will calculate probabilities, find confidence intervals and perform a variety of hypothesis tests.
   - **Assessment:** Assessment exam that demonstrates CT2.

2. **Core Objective (Communication):** Develop, interpret, and express ideas through effective visual communication. (CS3)
   - **Course Student Learning Objective:** Students will create, interpret, draw conclusions from histograms, box plots, and scatter plots.
   - **Assessment:** Assessment exam that demonstrates CS3.

3. **Core Objective (Empirical and Qualitative Skills):** Manipulate and analyze numerical data and arrive at an informed conclusion. (EQS1)
   - **Course Student Learning Objective:** Students will use the facts, formulas, and techniques learned in this course to find regression equations; use regression equations to make predictions.
   - **Assessment:** Assessment exam that demonstrates EQS1.
# Tentative Course Schedule (subject to change and adaptation)

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<thead>
<tr>
<th>Week</th>
<th>Topic/Material Covered</th>
<th>Textbook section</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Syllabus, classroom expectations, Statistics Basics</td>
<td>1.1</td>
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<td></td>
<td>Simple Random Sampling, Sampling &amp; Experimental Designs</td>
<td>1.2, 1.3, 1.4</td>
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<tr>
<td>2</td>
<td>Variables &amp; Data, Organizing Data</td>
<td>2.1, 2.2, 2.3</td>
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<tr>
<td></td>
<td>Distribution Shapes, Misleading Data, Measures of Center</td>
<td>2.4, 2.5, 3.1</td>
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<tr>
<td>3</td>
<td>Measures of Center, Measures of Variation</td>
<td>3.1, 3.2</td>
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<tr>
<td></td>
<td>Measures of Variation, Boxplots</td>
<td>3.2, 3.4</td>
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<tr>
<td>4</td>
<td>Linear Equations and Linear Regression</td>
<td>4.1, 4.2</td>
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<tr>
<td></td>
<td><strong>Review/TEST</strong></td>
<td></td>
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<tr>
<td>TBA</td>
<td><strong>Meet in Room 200 with ASU Representative</strong></td>
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<tr>
<td>5</td>
<td>Probability Basics and Rules of Probability</td>
<td>5.1, 5.3</td>
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<td></td>
<td>Discrete Random Variables</td>
<td>5.4, 5.5</td>
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<td>6</td>
<td>Normally Distributed Variables, Standard Normal Curve</td>
<td>6.1, 6.2</td>
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<tr>
<td></td>
<td>Working with Normally Distributed Variables</td>
<td>6.2, 6.3</td>
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<tr>
<td>7</td>
<td>Sampling Distributions; Mean and Standard Deviation of Sample Mean</td>
<td>7.1, 7.2</td>
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<tr>
<td></td>
<td>The Sampling Distribution of the Sampling Mean</td>
<td>7.3</td>
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<tr>
<td>8</td>
<td><strong>Review/Test</strong></td>
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<td></td>
<td>Estimating a Population Mean; confidence Intervals when $\sigma$ is known</td>
<td>8.1, 8.2</td>
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<tr>
<td>9</td>
<td>Confidence Intervals when $\sigma$ is unknown and for One Population Proportion</td>
<td>8.3, 11.1</td>
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<td>Nature of Hypothesis Testing/ Hypothesis Testing for a Sample Mean</td>
<td>9.1, 9.2, 9.4</td>
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<td>10</td>
<td>Hypothesis Testing for a Sample Mean and for One Population Proportion</td>
<td>9.5, 11.2</td>
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<td>Chi-Squared Distribution, Goodness-of-Fit Test</td>
<td>12.1, 12.2</td>
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<tr>
<td>11</td>
<td>Chi-Squared Independence Test</td>
<td>12.4</td>
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<td>Confidence Intervals &amp; Hypothesis Tests</td>
<td>Ch 8, 9, 11, 12</td>
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<tr>
<td>12</td>
<td><strong>Review/Test</strong></td>
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<tr>
<td></td>
<td>Review for Final Exam</td>
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<td>No work accepted after W5/8/19</td>
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<tr>
<td>13</td>
<td>Final Exam</td>
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<td>Tentatively scheduled for R5/9/19 &amp; F5/10/19 during class time.</td>
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Syllabus Statements

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Student Disability Services

ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student’s responsibility to initiate such a request by contacting:

Ms. Dallas A. Swafford  
Director of Student Disability Services

- 325-942-2047
- dallas.swafford@angelo.edu
- Houston Harte University Center

Title IX Statement

Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU’s Title IX Coordinator:

Michelle Nicole Boone, J.D.  
Director of Title IX Compliance

- Michelle.boone@angelo.edu
- 325-486-6357
- Mayer Administration Building 204

Student Absence for Observance of Religious Holy Days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information.

Incomplete Grade Policy

It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

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Student Conduct Policies

Academic Integrity

Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU.

Plagiarism

Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center.

Copyright Policy

Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

General Policies Related to This Course

All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook
- Angelo State University Catalog

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